10CFR50.73

Virginia Electric and Power Company
Surry Power Station
5570 Hog Island Road
Surry, Virginia 23883

December 9, 2014

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555-0001

Serial No.: 14-522
SPS: JSA
Docket No.: 50-281
License No.: DPR-37

Dear Sirs:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to Surry Power Station Unit 2.

Report No. 50-281/2014-002-00

This report has been reviewed by the Station Facility Safety Review Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,

N. L. Lane
Site Vice President
Surry Power Station

Enclosure

Commitment contained in this letter: None

cc: U.S. Nuclear Regulatory Commission, Region II
Marquis One Tower, Suite 1200
245 Peachtree Center Ave., NE
Atlanta, GA 30303-1257

NRC Senior Resident Inspector
Surry Power Station

IE22
NRR

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Surry Power Station, Unit 2	05000-281	1 OF 3

4. TITLE

Reactor Trip Due to Loose Termination on Reactor Trip Relay

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
10	13	2014	2014	- 002	- 00	12		2014	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
N	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
N. L. Lane, Site Vice President	(757) 365-2001

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	JC	BKR	W120	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On October 13, 2014 at 07:58, with Units 1 and 2 at 100% power, Unit 2 experienced a reactor trip due to a spurious opening of the Unit 2 "B" reactor trip breaker due to a loose screw on a reactor protection trip relay for the reactor trip breaker.

All three auxiliary feedwater pumps automatically started on low-low steam generator water level providing flow to the steam generators. The rapid increase in steam generator pressure on the relief valve setpoints resulted in the lifting of all three steam generator power operated relief valves. Unit 2 was placed in hot shutdown and the health and safety of the public were not affected. The loose screw on the reactor protection trip breaker relay was tightened and the breaker was closed successfully. Remaining connections on the Unit 2 relay control circuitry were checked for tightness. Unit 1 reactor trip breaker relay control circuitry will be checked for tightness at the next available opportunity. Torque requirements for terminal screws will be incorporated into the Surry Electrical Installation Specification and applicable procedures will be revised to include the torque requirements.

This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A) as an event that resulted in the automatic actuation of the Reactor Protection System and the Auxiliary Feedwater System.

NARRATIVE

1.0 DESCRIPTION OF THE EVENT

On October 13, 2014 at 07:58, with Units 1 and 2 at 100% power, Unit 2 experienced a reactor trip due to a spurious opening of the Unit 2 "B" reactor trip breaker (RTB). A loose screw at terminal 1 on the "B" RTB reactor protection trip relay [EIIS-JC-RLY] RT2YB in the reactor protection system caused a fault in the circuit to the "B" RTB under-voltage coil, tripping the reactor without a reactor first out annunciator, and initiating a turbine trip. The opening of "B" RTB removed power from the Control Rod Drive Mechanisms causing the control rods to drop and the delta flux to become very negative inducing a penalty on the overpower differential temperature (OPDT) and overtemperature differential temperature (OTDT) setpoints. The second "A" RTB opened due to the OPDT and OTDT set points being exceeded. As a result, Unit 2 was initially thought to have tripped due to the spurious OPDT signal as reported in the 10CFR50.72 reports.

The plant responded to the reactor/turbine trip as designed. All three auxiliary feedwater (AFW) pumps [EIIS-BA-P] automatically initiated on low-low steam generator (SG) water level providing flow to the SGs [EIIS-AB-SG]. A rapid increase in SG pressure on the relief valve setpoints resulted in the lifting of all three SG power operated relief valves (PORVs) [EIIS-SB-RV] as designed. The combination of the PORVs lifting, the actuation of the steam dumps and the initiation of AFW resulted in the Unit 2 reactor coolant system (RCS) cooling down below the nominal temperature of 547°F to 542°F. At 08:28, main feedwater flow was re-established to control SG level. AFW was subsequently secured by procedural guidance and Unit 2 was placed in hot shutdown using normal operating procedures.

The Source Range Nuclear Instrument (SRNI) detectors [EIIS-IL-RI] did not energize automatically because the Intermediate Range Nuclear Instruments N-35 and N-36 did not decay to < $5X10^{-11}$ amps due to recently installed secondary sources. The SRNIs were energized manually in accordance with abnormal procedures.

At 11:13, a four-hour report was made pursuant to 10CFR50.72(b)(2)(iv)(B) due to valid automatic actuation of Reactor Protection Systems and an eight-hour report was made pursuant to 10CFR50.72(b)(3)(iv)(A) due to automatic actuation of the AFW System.

This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A) as an event that resulted in the automatic actuation of the Reactor Protection System and the AFW System.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Surry Power Station	05000 - 281	2014	- 002	- 00	3 OF 3

NARRATIVE

2.0 SIGNIFICANT SAFETY CONSEQUENCES AND IMPLICATIONS

This event resulted in no safety consequences or implications. There was no testing or surveillances in progress when the reactor trip occurred. Appropriate operator actions were taken in accordance with emergency operating procedures and the unit was quickly brought to a stable condition. Station equipment relied upon to mitigate the event responded as designed. Therefore, the health and safety of the public were not affected.

3.0 CAUSE

The direct cause for the automatic reactor trip was determined to be a loose screw at terminal 1 on Unit 2 "'B" RTB reactor protection trip relay RT2YB.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

The loose screw at the terminal on the Unit 2 "B" RTB reactor protection trip relay was tightened and the breaker was closed successfully.

5.0 ADDITIONAL CORRECTIVE ACTIONS

The remaining electrical connections on the U2 reactor trip breaker "A" & "B" relay control circuitry were checked and tightened as appropriate. Electrical connections on the Unit 1 RTB relay control circuitry will be checked for tightness at the next available opportunity. The SRNI detectors not energizing automatically and the Unit 2 RCS cooling below the nominal temperature of 547°F to 542°F have been entered into the corrective action program.

6.0 ACTIONS TO PREVENT RECURRENCE

Torque requirements for terminal screw sizes #2, #4 and #6 will be incorporated into the Surry Electrical Installation Specification, and applicable procedures will be identified and revised to include the torque requirements.

7.0 SIMILAR EVENTS

None

8.0 MANUFACTURER/MODEL NUMBER

Westinghouse Electric Corporation/ BFD22S

9.0 ADDITIONAL INFORMATION

Unit 1 was at 100% power and remained unaffected by the Unit 2 reactor trip.